

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)**ScienceDirect**journal homepage: <http://www.elsevier.com/locate/rpor>**Editorial****Stereotactic Body Radiation Therapy: A useful weapon in anticancer treatment**

Stereotactic Body Radiation Therapy (SBRT) is a modern technique that allows the delivery of ablative radiation doses in few fractions.<sup>1</sup>

Compliance of patients is good, since SBRT is a non-invasive, well tolerated and painless therapy which does not require any anesthesia. Generally, it is completed in a short course out-patient setting (within one or two weeks) with a positive impact on the logistic management of the treatment for both the patient and the Institution.<sup>2,3</sup>

Moreover, several studies have demonstrated that SBRT can achieve excellent local control rates in both primary tumors and metastatic lesions, with good toxicity profile.<sup>4</sup>

In this Special Issue, several authors with recognized skill in the field of hypofractionation describe the role of SBRT in inoperable or borderline resectable primary tumors and in oligometastases.

For patients suffering from early stage non-small cell lung cancer, unfit for surgery, SBRT has become a standard therapeutic option. Chehade et al. reviewed indications, optimal dose and fractionation, providing further insight also on the role of this technique in patients with higher operative risks, such as the elderly or those with severe COPD.<sup>5</sup>

In the last years increasing evidence has supported the role of extreme hypofractionated radiotherapy for localized prostate cancer. This topic is analyzed by Alongi et al., who report the most recent data about radiobiology, technological aspects and published studies. Although more mature results and longer follow-up are needed, the available experiences warrant the use of SBRT in the treatment of well selected prostate cancer patients.<sup>6</sup>

Wang et al. provided an original review on the role of SBRT for HCC. Since 2014, National Comprehensive Cancer Network (NCCN) guidelines introduced the use of SBRT for patients with hepatocellular carcinoma unfit for surgery. The authors confirm that SBRT could be a safe and effective therapeutic option in multimodality management of patients with HCC unsuitable for surgery or other local treatments.<sup>7</sup>

Arcangeli et al. reviewed and discussed the role of SBRT as a retreatment for prostate cancer patients already submitted to radiotherapy. Presently the main therapeutic option in recurrent prostatic carcinoma after radiation is androgen deprivation therapy, but the improvement in image guidance

and treatment delivery techniques allows to re-think this paradigm. Few data are available in literature, but SBRT should find a place even in irradiated, recurrent prostate cancer.<sup>8</sup>

The role of SBRT in skull base recurrences is reviewed by Krengli et al. These authors present a critical analysis of the most recent available literature on the management of patients affected by meningioma, pituitary adenoma, craniopharyngioma, chordoma and head and neck tumor with recurrent disease at the skull base and treated by SBRT. They suggest that SBRT is an effective and safe radiation modality in this setting. They also recommend that the management of these challenging treatments should be decided in high performance centers after multidisciplinary evaluation.<sup>9</sup>

There are a small number of published studies evaluating the role of SBRT in local failure after primary radiotherapy for lung cancer. Amendola et al. reviewed literature data and reported their preliminary experience, demonstrating that SBRT can be considered to retreat patients relapsing after conventional irradiation, achieving encouraging results in terms of local control with acceptable toxicity.<sup>10</sup>

In the oligometastatic setting, there is a plethora of published data indicating SBRT as a promising option in lung metastases. Navarria et al. tried to define the perfect candidate to this strategy, suggesting that patients with a primary breast cancer, a disease-free interval of more than 12 months, a controlled primary tumor, might have a major benefit from SBRT, especially if they have a limited number of small lesions, treated with higher doses.<sup>11</sup>

Greco et al. reviewed the evolution of SBRT and radiosurgery for spine metastases. Technological advances, such as IGRT and IMRT, allow now a more accurate definition of target volume, with a rapid dose fall-off to surrounding healthy tissues, such as the spinal cord. With these technologies single-dose spine SBRT, can safely yield excellent results.<sup>12</sup>

Comito et al. reported the published experiences on the role of SBRT in treating liver metastases from different cancers. The authors discussed about patient' selection, dose prescription, target definition, planning and delivery of treatment, and response evaluation. They highlight the role of SBRT in the treatment of patients with liver metastases not suitable for surgical resection.<sup>13</sup>

Jereczek-Fossa et al. evaluated the available literature on the SBRT as a therapeutic approach to lymph node recurrent cancer, confirming that this novel radiotherapy modality, achieves optimal results in terms of local control with acceptable toxicity compared to conventional techniques.<sup>14</sup>

Ippolito et al. discussed on SBRT as an alternative local ablative treatment modality on adrenal gland metastases, showing its promising, preliminary results, especially in selected patients with oligometastatic disease.<sup>15</sup>

Hajj and Goodman answered the question: "Pancreatic cancer and SBRT: a new potential option?". Literature data proved that SBRT can be easily integrated into a regimen of aggressive chemotherapy and that it could be considered a comparable, noninvasive alternative to surgery. In selected, optimally responding cases, SBRT could also allow the resectability of previously inoperable patients.<sup>16</sup>

In conclusion, SBRT proved to be a safe and effective strategy for a wide range of primary and metastatic lesions. Increasing evidence has been showing additional applications of this technique, also helping to better understand its mechanism of action on cancer cells. In fact, beyond the direct cell killing, an abscopal effect, similar to that observed in other malignancies such as renal cancer and melanoma, may also justify the regression of non-irradiated lesions distant from the irradiated one.<sup>17</sup> Obviously, several aspects of stereotactic radiotherapy deserve further investigation: first of all, an accurate patient' selection, now possible with the modern techniques of molecular and functional imaging. Dose-escalation studies, may be useful, in order to better define the best dose and fractionation, as well as the safest dose constraints relative to the different organs at risk. Randomized studies with other consolidated therapeutic strategy should be helpful to confirm the potential role of SBRT in the treatment of several early and oligometastatic cancers. The integration with the novel target therapies, now available for almost every neoplasms, may further broaden the field of action of this modern radiotherapy technique.<sup>18,19</sup>

## Conflict of interest

None declared.

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